

**CALIFORNIA DIVISION OF MINES AND GEOLOGY
FAULT EVALUATION REPORT FER-212**

**Faults in the Lake Almanor Area
Plumas and Lassen Counties, California**

By
Christopher J. Wills
Associate Geologist

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INTRODUCTION

Northwest trending normal faults cross state highway 36 between Chester and Westwood on the north side of Lake Almanor (Figure 1). These faults offset Pliocene and Pleistocene volcanic rocks as well as Quaternary lake beds (Lydon and others, 1960). They are similar in orientation and sense of offset to active faults to the northwest along the Hat Creek Rim and possibly active faults to the northwest near Eagle Lake. Because these faults are in a relatively populous area within the current Modoc Plateau study region they are evaluated here for possible zoning under the Alquist-Priolo Special Studies Zone Act (Hart, 1988).

SUMMARY OF AVAILABLE DATA

Northwest trending faults between Chester and Westwood were first mapped by Diller (1895) as part of his regional study of the Lassen Peak Folio. His map shows a fault trending northwest from the Almanor Peninsula and another along Rock Creek. More recent mapping by Lydon and others (1960) shows these faults in more detail (Figure 1). A complex set of faults offsets Pliocene basalt west of the Almanor Peninsula and a fault offsets Pleistocene basalt near Clear Creek. Recent mapping of the Almanor quadrangle by Jayko (1988) does not show any faults offsetting late Quaternary units although several northwest trending faults are shown in Mesozoic and Paleozoic rocks southwest of Lake Almanor (similar to those mapped by Lydon and others, 1960) (Figure 1).

INTERPRETATION OF AERIAL PHOTOGRAPHS AND FIELD CHECKING

Geomorphic evidence for recent faulting was interpreted from aerial photographs and plotted on 15-minute topographic maps (Figure 2). Aerial photographs of 1:24,000 scale taken by the U.S. Forest Service in 1982 and 1983 were used for the entire area.

Geomorphic expression of faulting and units offset by faults were field checked on June 9 and September 27, 1989. Geomorphic evidence for recent faulting was noted and the degree of weathering or soil development was noted at several localities where evidence for or against Holocene fault offset was expected to be particularly clear, based on the aerial photo interpretation.

Faults west of Almanor Peninsula

North to northwest trending normal faults form prominent west facing scarps along the east side of Mud Creek and along the west side of the Almanor Peninsula (Figure 2). A low scarp on the south side of Lake Almanor lies along the trend of the fault west of the Almanor Peninsula and is probably related to that fault. The faults north of the lake are defined by broad, degraded scarps in Pliocene basalt. The deep red soil and colluvium that covers these scarps suggest that they have been eroding for a considerable part of Pleistocene time. The lack of any sharp scarplets near the base of these scarps and the incision of the scarps by minor streams suggest that these faults have not been active in late Pleistocene or Holocene time. Quaternary lake beds, shown as faulted by Lydon and others (1960) are now covered by the waters of Lake Almanor.

Fault east of Clear Creek

A scarp in Pleistocene basalt just east of the village of Clear Creek is the sharpest scarp in the area. The sharpness of the scarp and presence of side-hill benches, troughs and minor back-facing scarps probably indicate late Quaternary offset (Figure 2). The scarp is up to 120 feet high and has slopes as steep as 20 degrees but is covered by talus and colluvium and has been incised by Dry Creek and the Hamilton Branch of the Feather River. Steepening at the base of the scarp, scarps in the talus, or other indications of Holocene activity were not noted on aerial photographs or in the field. There does not appear to have been substantial Holocene displacement along this fault, although minor movements cannot be ruled out.

SEISMICITY

The Lake Almanor area is within a broad zone of earthquakes of magnitude 3 or less that can be traced from Lake Tahoe to the Mt. Lassen area. Earthquakes of Magnitude 4.5 on 5/1/41 and 8/21/49 are the largest earthquakes in the Lake Almanor area listed in the U.C. Berkeley Catalog (Bolt and Miller, 1975). None of the listed earthquakes is located with enough precision to be related to a specific mapped fault.

CONCLUSIONS

North to northwest trending normal faults offset Pliocene and Pleistocene volcanic rocks in the Lake Almanor area. The faults west of the Almanor peninsula are relatively eroded, incised and covered by colluvium. They do not appear to have been active in late Quaternary time. The fault east of Clear Creek is much fresher in appearance and offsets younger rocks. It may have been active in late Quaternary time. No evidence for Holocene offset was observed on aerial photos or in the field.

RECOMMENDATIONS

The faults in the Lake Almanor area evaluated in this report should not be zoned for special studies under the Alquist-Priolo Special Studies Zones Act.

C. J. Wills

C.J. Wills
Associate Geologist
C.E.G. 1423

*FER-212 reviewed;
recommendations approved.
Earl W. Hart
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